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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Eric BARLOW et al.

Serial No.: 09/508,369 Group Art Unit 1775

Filed : June 14, 2000 Examiner: J.C. McNeil

For : COATED ALUMINIUM WORKPIECE

FIRST REPLY TO FINAL REJECTION

1185 Ave. of the Americas
New York, N.Y. 10036
May 24, 2004

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R:

In response to the final Office Action dated July 28, 2003, applicants respectfully request reconsideration and allowance of the above-identified application for the reasons set forth below.

Claims 1 - 4, 9 - 11, 13 - 16, 18, 19 and 21 are currently pending in the application. Of these, method claims 15, 16, 18, 19 and 21 have been withdrawn from consideration following a requirement for restriction, although the Examiner has heretofore indicated that they might be considered for rejoinder with the article claims upon allowance of the latter. Article claims 1 - 4, 9 - 11, 13 and 14, of which only claim 1 is independent, have been finally rejected under 35 U.S.C. §103(a) as unpatentable over EP 426328 A2 (Matsuo et al.); claims 1 - 4, 10, 13 and 14 have also been rejected under §103(a) as unpatentable over U.S. patent No. 5,395,687 (Totsuka et al.). No claim has been allowed.

In rejecting claims 1 - 4, 9 - 11, 13 and 14 on Matsuo et al., the Examiner asserts that the reference teaches coating a work article surface with an anodic oxide coating followed by a resin coating, and also teaches that the article may comprise an aluminum plate and that the resin coating may comprise additives such as MoS_2 and SiO_2 . It is respectfully submitted, however, that the Examiner has not established a *prima facie* case of obviousness of claim 1 over Matsuo et al.

The Examiner recognizes that Matsuo et al. does not specify the thickness of the anodic oxide layer as required by present claim 1, which sets forth an oxide film that is formed anodically, having a thickness of 10-200 nm.

Claim 1 also differs from Matsuo et al. in that claim 1 specifies that a coating on the oxide film consists essentially of at least one adhesion promoter containing one or more of Cr, Mn, Mo, Si, Ti, Zr and F. Matsuo et al. does not disclose such an adhesion promoter coating; instead Matsuo et al. discloses a coating comprising a resin and electrically conductive particles of, for example, molybdenum disulfide (MoS_2), the resin coating having a specified varistor property.

There is no motivation in the prior art for the artisan of ordinary skill to modify Matsuo et al. so as to provide an anodic film with a thickness of 10-200 nm as required by claim 1.

The final Office Action asserts that it would have been obvious to provide the anodic oxide film in this thickness in order to protect the underlying substrate and also provide adhesion for the overlying layers. However, no such suggestion or motivation is supplied by Matsuo et al., because Matsuo et al. makes no reference to the usefulness of an anodic oxide film in protecting the underlying substrate, nor the beneficial properties of providing adhesion for the overlying layers. Both of these

significant advantages are disclosed in the present application and not in the prior art.

The only disclosure of anodic films in Matsuo et al. is an aside (see p. 4, lines 37-39). It is specifically stated there that an anodically oxidizing film forming treatment can be employed in order to degrease oils and fats or dusts attached to the work metal before the coating is employed. There is no disclosure of the benefits of forming the anodic oxide film itself; for Matsuo et al., an anodic oxide film is merely an irrelevant consequence of the degreasing treatment disclosed therein.

Because an anodically oxidizing film forming treatment is disclosed only in relation to degreasing, Matsuo et al. provides no motivation to produce a particular thickness of anodic oxide film on an aluminum sheet.

In fact, the clear disclosure of Matsuo et al. would teach away from providing a particular thickness (much less the thickness of 10-200 nm specified in applicants' claim 1) because Matsuo et al. relates to a coating on a workpiece with particular varistor properties deriving mainly from the resin/electrically conductive particles coating. A person of ordinary skill in the art would recognize that modifying the thickness of an anodic oxide film (which is well known to be either poorly conductive or insulating) would dramatically affect the varistor properties. This effect would be considered undesirable by the artisan of ordinary skill because it would not relate to the coating, to which Matsuo et al. is directed, of resin/electrically conductive particles (especially MoS_2).

Therefore, it is quite clear that the ordinarily skilled artisan would have no motivation to modify Matsuo et al. so as to provide an anodic oxide film 10-200 nm thick.

It is also submitted that the artisan of ordinary skill would have no motivation to provide an adhesion promoter coating.

The Examiner appears to suggest that the epoxy resin/particle coating of Matsuo et al. is an adhesion promoter coating. However, this is clearly incorrect. The epoxy resin of Matsuo et al. is not a pre-treatment layer because it is much thicker than an ordinarily skilled person would expect for a pre-treatment layer (being between 0.5 and 20 microns thick; see, for example, p. 4, lines 47-48). Because of its thickness, a person of ordinary skill in the art would instead consider this thicker resin layer to be an electrically conducting paint primer.

To illustrate the point, in examples 1 and 3 of the present specification, a further coating applied on top of the inventive layers is an electro-conducting layer of epoxy based Bonazinc with a thickness of 5-9 microns (i.e., within the Matsuo et al. range for this second layer thickness). In example 3, this Bonazinc layer is described as an epoxy-based paint primer. Also from the examples, Table 5 (example 5) shows the thickness of two of the adhesion promoting layers as 25 and 40 nm; they are much thinner than the epoxy resin coating used by Matsuo et al.

In view of the above, it is clear that persons of ordinary skill would have no motivation to modify the Matsuo et al. reference in order to arrive at the subject matter of claim 1.

Even were an ordinarily skilled artisan to attempt to modify the prior art in the way suggested by the Examiner, he or she would have no reasonable expectation of successfully providing improved adhesion properties. There is no clear disclosure anywhere in Matsuo et al. of beneficial adhesion properties that are provided by an aluminum workpiece comprising an anodic oxide film of 10-200 nm thickness together with an adhesion promoter coating. The only references in Matsuo et al. to aluminum are made as an aside. The whole tone of the teaching of Matsuo et al.

is to steel sheets (see, for example, p. 2, lines 51-52, and p. 5, lines 21-22, relating to the examples).

Finally, there is of course, no teaching anywhere in Matsuo et al. to provide an anodic oxide film of 10-200 nm thickness, nor, as argued above, to provide an adhesion promoter coating.

In view of these comments, it is quite clear that the Examiner has failed to establish a *prima facie* case of obviousness of claim 1 from the teaching of Matsuo et al. Claim 1 therefore distinguishes patentably over this reference.

The remaining article claims (2 - 4, 9 - 11, 13 and 14) distinguish in like manner over Matsuo et al., by virtue of their dependence on claim 1.

The final Office Action also refers to a weight of adhesion promoter coating (first line of last paragraph on page 2 of the Office Action). Weight of the adhesion promoter coating is specified in applicants' claim 11, which recites that the adhesion promoter coating is present at a weight of 2-100 mg/m². The Examiner has recognized that there is no disclosure in Matsuo et al. of a coating having this weight per unit area.

It would be quite clear to persons skilled in the art that the weight per unit area of the epoxy resin coating disclosed in Matsuo et al. is much greater than that specified in claim 11. In order for a coating having the weight per unit area specified in claim 11 to fall within the Matsuo et al. range of 0.5 microns to 20 microns (see p. 4, lines 47-48), the density of the epoxy resin disclosed in Matsuo et al. would have to be 0.2 g/cm³ or lower. This corresponds to one-fifth the density of water. It would be quite clear to persons skilled in the art that epoxy resins do not have such a low density. Further support is provided for this argument by example 5 (table 5) of the present application which indicates that the adhesion promoter coatings are specified as having a thickness of 25 or 40 nm in that example.

It is therefore further respectfully submitted that the Examiner has not established a *prima facie* case of obviousness against claim 11 in view of Matsuo et al.

In the rejection of claims 1 - 4, 10, 11 and 13 as unpatentable over Totsuka et al., the Office Action contends that Totsuka et al. teaches a surface treated aluminum material first coated with a chromate film which may be deposited electrolytically. The Examiner also asserts that this chromate film may be followed by an organic resin coating, including organic polymers and electro-conductive finely divided particles such as chromium.

As recognized by the Examiner, claim 1 of the present application differs from the disclosure of Totsuka et al. in that the reference does not specify the thickness of an anodic oxide layer, much less a thickness of 10-200 nm as required by claim 1.

The Examiner asserts that optimization of this thickness would be within the purview of one of ordinary skill in the art. Applicants respectfully submit that this assertion is incorrect and that claim 1 is not *prima facie* obvious from Totsuka et al.

A person of ordinary skill in the art would have no motivation to modify Totsuka et al. in a way that would approach the subject matter of present claim 1. There is no disclosure in Totsuka suggesting modification of the anodic oxide film in order to provide a thickness within the range of 10-200 nm.

In fact, the reference teaches away from providing any anodic oxide film at all. Totsuka et al., at col. 3, lines 60-63, teaches that an oxide film on the welding surface of the aluminum alloy plate insulates the electric current which has the result of inhibiting the rapid welding of aluminum alloy plate. The disclosure of Totsuka et al. is directed to providing an aluminum material which may be more easily spot-welded (see, for example, col. 1, lines 8-16). Consequently, the passage referred to above in Totsuka et al. points away from providing an oxide film on the

surface of aluminum, in order to avoid the disadvantage of inhibiting rapid spot-welding of the aluminum substrate.

In fact, Totsuka et al. teaches that it is preferred to remove an oxide layer on an aluminum substrate in order to form a consistent chromate film (which is an aim of the invention disclosed in Totsuka et al.). At col. 7, lines 34-38, it is explicitly disclosed that, before subjecting the aluminum substrate to a subsequent chromate treatment, an oxide film formed on the substrate in the process of its production may be removed in order to form a consistent chromate film.

Therefore, an artisan of ordinary skill, on considering the teaching of Totsuka et al., would be motivated away from providing any oxide film at all, much less an anodic oxide film having a thickness within the range of 10-200 nm.

Furthermore, a person of ordinary skill in the art would have no reasonable expectation of success in modifying the disclosure of Totsuka et al. in order to provide corrosion resistance and improved adhesion properties, as provided by the present invention. These properties are achieved in the present invention by a combination of both an anodic oxide film having a specified thickness and also the presence of an adhesion promoter coating. Because Totsuka et al. teaches away from providing any oxide film at all, much less an anodic oxide film having a specified thickness, there would be no reasonable expectation of success if Totsuka et al. were modified to provide an anodic oxide film having a thickness of 10-200 nm.

Finally, of course, Totsuka et al. does not suggest or teach applicants' claimed anodic oxide film thickness of 10-200 nm.

In view of the above, it is quite clear that claim 1 should not be considered *prima facie* obvious from Totsuka et al. The remaining claims are likewise allowable because they are dependent on claim 1.

In light of the allowability of article claim 1 and the claims dependent thereon, explained above, rejoinder and allowance of the nonelected method claims are also respectfully solicited.

For the foregoing reasons, it is believed that this application is now in condition for allowance. Favorable action thereon is accordingly courteously requested.

Respectfully,

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